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## Air Pollution from Nearby Traffic and Children's Health: Information for Schools

Concerns about potential health hazards from spending time near roads with high car and truck traffic have been increasing in the past few years. In 2003, California enacted new legislation (SB 352, Escutia) to limit placement of new school sites close to a freeway or busy traffic corridor.

The Office of Environmental Health Hazard Assessment (OEHA), the California Air Resources Board (ARB), and the California Department of Health Services (DHS) have prepared this fact sheet to help school personnel understand the issues related to traffic near schools and children's health.

### Topics

- ❖ Concern about air pollution from traffic
- ❖ Places of exposure
- ❖ What can be done to reduce exposure

- ❖ Ventilation system issues
- ❖ Resources



### ❖ Why is there concern about air pollution from nearby traffic?

Scientists have found that motor-vehicle exhaust contains high concentrations of chemicals that can be harmful, including cancer-causing compounds and respiratory irritants. Concentrations of traffic pollutants can be substantially higher near busy roads.

Recent scientific studies from Europe and the United States have found that children living near busy roads have increased asthma symptoms and bronchitis. OEHA completed a study of children attending schools in neighborhoods near busy roads in Alameda County and found similar results. A small study of adults in the Netherlands suggests a link between long-term residence near busy roads and increased risk of heart and lung disease.

It makes sense to reduce our exposures to traffic pollution when possible. Schools can play an important role in helping to reduce children's exposures.

### ❖ Where are people exposed to air pollution from nearby traffic?

Motor vehicles are part of our every day lives. We breathe air with higher levels of traffic pollutants while:

- Driving in heavy traffic, such as on main city streets and on busy highways/freeways.
- Standing near idling cars, trucks, or buses.
- Spending time at places near roads that have heavy traffic, whether it is at home, school, work, or at play. Studies have found that places within 500 feet (150 meters) of main city streets, highways, and freeways generally have higher traffic pollutant levels, especially if the location is "downwind" of the road. ("Downwind" means that the wind generally blows from the road towards your location.)

Since children spend a significant part of their day at school, exposures during school-time and in-transit to and from school can be an important part of a child's overall exposure to traffic pollutants.



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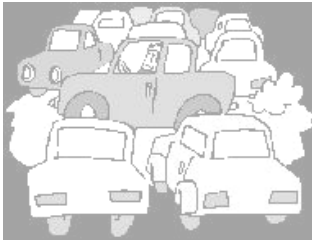


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❖ **Are there many schools in California located very close to freeways and busy roads?**

OEHHA recently studied the location of California public schools in relation to major roads. We found that about 2% of all public schools in California are located within 500 feet (150 meters) of a road with high traffic.



❖ **If a school is near a street with very heavy traffic, does it mean that children are exposed to high levels of traffic-related air pollution?**

Not necessarily. The prevailing wind direction strongly affects exposure to air pollution from nearby traffic. Locations that are both near and “downwind” of a freeway tend to have higher levels of traffic pollution compared with locations that tend to be “upwind” of a freeway. (“Downwind” means that the wind generally blows from the road towards your location. “Upwind” means that the wind generally blows away from your location, towards the road.)

Other factors include the locations where children spend most of their time while at school; at what time during the day children tend to play outdoors at school; and whether teachers keep doors and windows open during rush hour.

❖ **What can schools do to reduce children’s exposures to air pollution from motor vehicles?**

Schools can take several steps to reduce exposures to air pollution from nearby vehicles:

- Ensure that vehicle operators follow a recent statewide idling rule by ARB that requires the driver of a school bus, transit bus, or other commercial heavy-duty vehicle minimize idling at public and private schools (See ARB website listed in “Resources” for more information).
- Limit idling at loading docks and parking areas. If possible, avoid locating air-intake vents close to these areas. If teachers or students smell motor-vehicle exhaust in the classroom, alert school facilities staff to evaluate the situation.
- Develop a school-wide policy to minimize idling of cars at the school, especially during drop-off and pick-up times when many children are congregated nearby.
- Levels of diesel exhaust inside diesel school buses can be high. Purchase clean, low-emitting buses when replacing old diesel school buses and equip existing buses with exhaust particle filters. Both the US Environmental Protection Agency and ARB have established programs to help with purchasing clean, low-emitting buses and with cleaning-up existing buses.
- Remember that poor indoor air quality from sources inside the classroom may also contribute to respiratory symptoms. The US Environmental Protection Agency has a free, easy-to-use kit, “*Indoor Air Quality Tools for Schools*”, to help school officials prevent and resolve indoor air quality problems.



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❖ **Schools located near busy roads can take additional steps to decrease children's exposures.**

A properly working heating, ventilation, and air condition (HVAC) system will help decrease the amount of outdoor pollution that penetrates indoors.

The HVAC system should receive routine maintenance, especially changing filters. HVAC systems usually work best when windows and outside doors remain closed. Ask your school district facilities manager about the guidelines for proper operation and maintenance of the HVAC system in all regular and portable classrooms.

In addition to properly maintaining the ventilation system, schools can:

- Upgrade current HVAC filters to ones with a higher efficiency rating (e.g., 60-90% efficiency compared to the 10-30% standard filter). Gymnasiums or indoor areas where children exercise and play should be the first priority for placement of good efficiency air filtration systems.
- Close windows and doors during peak traffic hours. Check that there are not any substantial pollutant sources inside the room, as this can lead to poor indoor air quality.
- If possible, conduct outdoor school activities on a part of the campus farther from high traffic roads, especially during peak traffic hours.
- Fix building leaks that allow outdoor air to flow indoors.
- Work with officials to limit truck traffic near schools during school hours if the nearby roads are under local jurisdiction.
- Although sound walls and tree plantings near a busy road may help decrease noise pollution, their effect on lowering traffic emissions is not proven.

❖ **Should the ventilation system be turned off to decrease outdoor air exchange if there is outdoor air pollution?**

No. The HVAC system for your school is designed to provide adequate ventilation. Turning off the HVAC system will **increase** levels of indoor air pollutants.

❖ **Will a portable air filtration system or air cleaner help?**

Portable air filters equipped with high-efficiency particle or absorbent filters can clean the air of certain pollutants in a small space. However, they are often noisy, expensive to operate, and may be too small to be effective. Most do not remove pollutant gases, just particles.

The quietest room air cleaners operate without a fan and use an ionizer or ozone generator. Their effectiveness is often overstated, and some emit hazardous amounts of ozone. We do not recommend the use of any air cleaners that produce ozone, which is an irritant gas that can damage the lungs.

❖ **What else is being done to reduce children's exposures to traffic-related air pollution?**

The California Air Resources Board is working on many strategies to reduce emissions from motor vehicles. Programs range from developing cleaner fuels to lower tailpipe emissions standards. The State of California has also recently passed legislation requiring that school districts carefully evaluate new proposed school sites for potential exposures to high traffic roads.

The school environment is just one part of a child's overall exposure to traffic pollution. Our fact sheet, *"Air Pollution from Nearby Traffic and Children's Health: Information for Parents"*, provides information on what parents can do to reduce exposures in other settings (see "Resources", below).



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## ❖ RESOURCES

### Senate Bill 352, enacted 2004

Bill Information, 2003-2004 Session, SB352

<http://leginfo.ca.gov>

### California Air Resources Board

General Information (800) 242-4450 or (916) 322-2990

Fact sheets, brochures and videos

Air filters and air cleaners

Diesel school bus idling rules

Lower emissions school bus program

Children's School Bus Exposure Study

California Portable Classrooms Study

School health website

<http://www.arb.ca.gov>

<http://www.arb.ca.gov/html/fslist.htm>

<http://www.arb.ca.gov/research/indoor/acdsumm.htm>

<http://www.arb.ca.gov/toxics/sbidling/sbidling.htm>

<http://www.arb.ca.gov/msprog/schoolbus/schoolbus.htm>

<http://www.arb.ca.gov/research/health/school/sb-summ.htm>

<http://www.arb.ca.gov/research/indoor/pcs/pcs.htm>

<http://www.arb.ca.gov/school.htm>

### California Department of Education

Schools Facilities Planning Division (916) 322-2470

<http://www.cde.ca.gov/re/di/or/division.asp?id=sfpd>

### US EPA Indoor Air Quality Tools for Schools

Indoor Air Quality Information Clearinghouse (800) 438-4318

<http://www.epa.gov/iaq/schools/tools4s2.html>

### Information about Outdoor Air Pollution and Health

American Lung Association of California (510) 638-LUNG

<http://www.californialung.org/>

California Air Resources Board, health and air pollution

<http://www.arb.ca.gov/research/health/health.htm>

Non-Cal/EPA resources are provided as a service. Cal/EPA does not necessarily endorse the information on the websites of other organizations. Cal/EPA is not responsible for the content of the individual organization's webpages or documents found at these links.

## Office of Environmental Health Hazard Assessment

This fact sheet and a parent fact sheet, *"Air Pollution from Nearby Traffic and Children's Health: Information for Parents"*, are available at <http://www.oehha.ca.gov> or <http://www.eastbaykids.com>.

Journal article of OEHHA study *"Proximity of California Public Schools to Busy Roads"* is available at <http://ehpnet1.niehs.nih.gov/members/2003/6566/6566.html>

For more information on this fact sheet or additional questions, please contact the Office of Environmental Health Hazard Assessment, Air Toxicology and Epidemiology Section, 1515 Clay Street, 16<sup>th</sup> floor, Oakland, CA, 94612 (510) 622-3150

